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THE USE OF VINASSE IN AGRICULTURE

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THE USE OF VINASSE IN AGRICULTURE

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Vinasse is the most important residual product of the alcohol and spirits industry of Brazil. Though it abounds in organic colloidal substances and mineral elements, vinasse produces deleterious results if introduced into streams or rivers, as was the custom in Brazil until some years ago. This was done simply because it was impossible to dispose of vinasse in any other way, owing to the lack of an economically worthwhile process of recuperation. Consequently, vinasse constituted a serious danger to public health, to the economy, and to the fish population, besides giving rise to popular unrest in a number of regions in Brazil where the degree of pollution reached truly astronomical proportions. From the economic point of view, filtration, decanting, oxygenation and evaporation methods for the recuperation of vinasse in solid form are either completely ineffective or else too expensive.

Having analysed the composition of vinasse and made a good many tests in the laboratory, in drying-rooms and on an agricultural scale, a research team of the Institute of Fermentation Technology and their assistants succeeded in finding the solution to this problem. This is to use vinasse as a fertiliser, without any treatment, but hot, as it comes pouring out from the distilling machinery, and at once. This new process was tried out in the soil conditions of the State of Sao Paulo, and proved to be not only rational and economic but also capable of absorbing the entire supply of vinasse from any distillery.

Vinasse is spread on ground previously ploughed, harrowed, and furrowed in contour-lines over an area large enough to absorb the full amount required from a campaign. The furrows should be spaced 1.5 metres apart, and cut to a depth of 20 to 30 centimetres.

The vinasse is drained off in its natural state - i.e. hot, undiluted, and without being neutralised.

The amount to be used varies according to soil conditions. Where the pH of the soil is less than 4, the amount should be 1,000,000 litres, or 100 litres per metre length of furrow. Where the pH is between 4 and 5, the amount should be 850,000 litres, or 95 litres per linear metre. But where the pH is higher than 5, irrigation should be limited to 650,000 litres, or 70 litres per linear metre of furrow.

The application of the entire supply of vinasse available to the furrows of the land previously prepared should be carried on throughout the duration of the campaign, either continuously or at intervals, according to the system of transport adopted by the industry.

Any area on which vinasse has been used, as suggested above, is not to be irrigated again until all the other sections of the farm have been similarly treated.

If the methods described above are properly applied, there will be no danger of offensive smells during treatment with vinasse, for the entire quantity seeps rapidly into the ground, with no risk of putrefactive fermentation and its disadvantages.

Because it is rich in organic and mineral substances, vinasse ranks as a highly valuable fertiliser capable of raising the pH of the soil to alkaline values. Vinasse increases the microbe population in the land to which it has been applied to an incredible degree; it increases the water absorbing capacity; it improves the retention of mineral salts; it eliminates erosion; it modifies the typical vegetation and promotes the growth cycle of sugar-cane. While it causes some delay in the ripening of sugar-cane, vinasse improves its sucrose content and the purity of the juice.

The detrimental influences on streams and waterways disappear; plankton in streams and rivers is restored, and so are the positive organoleptic properties of the water.

The biological equilibrium of the waterways is likewise restored, while the fish population returns to streams and rivers, thus contributing to Brazil's reserves of fish.

The recuperation of vinasse, and the fact that it is now no longer discharged into streams and rivers, has led to an improvement in the general standard of health with corresponding benefits to the population, who are now free from diseases formerly transmitted by mosquitoes and microbes.

Higher health standards have in turn led to stability on the social plane, thanks to the return of normal living conditions along the waterways.

Recuperation of vinasse has, moreover, a direct bearing on the saving of foreign currency by reducing the need for imports of fertilisers, in particular those containing potash, and by increasing agricultural production a factor between 3 and 10, as compared with non-irrigated land.

Vinasse can be distributed by tanker-trucks by gravity descent, by mixing with irrigation water, and by using pressurised pipe-lines.

Tests made to ascertain the amount of corrosion caused by vinasse in pipes have shown that pipes made of stainless steel or of polyvinyl chloride (PVC) are most resistant to corrosion. Next on the list are copper, brass, duralumin, lead, and iron - in order of strength.

Besides being an extremely powerful fertiliser for sugar-cane and other crops, vinasse is also a good culture medium for the development of special yeasts and for mushrooms, for the preparation of high-grade protein for both human and animal consumption.

Plans are currently under consideration for vinasse to be included in animal foods, in order to improve the digestive qualities and flavour of certain types of flour.